

Atty's 22910

Pat. App. Not known - US phase of PCT/EP03/00355

CLAIM AMENDMENTS

1. (original) A satellite transmission having an input element and an output element that can provide different transmission ratios by shifting into various concentric or eccentric positions and that include a ring (10) with an annular groove (12) and a star body (13) with radial grooves (14), and satellites (15, 35, 50) which are coupled to the ring (10) and that transmit torque to the star body (13) by means of coupling pins (21, 52), characterized in that in order to reduce or eliminate irregularities by varying the effective radius in a load zone, each satellite (15, 35, 50) has a radial slot (14, 51) in which can move the respective coupling pin (21, 51) when in the load zone at least relative to a center of the ring (10).

2. (currently amended) The satellite transmission according to claim 1, characterized by a radial groove (20, 51) whose length permits generally no movement of the coupling pin (21, 51) relative to a center of the star body (13).

3. (currently amended) The satellite transmission according to claim 1 or 2, characterized in that as a result of the relative geometric relationships and/or the coefficient of friction, the coupling pins in the grooves (14) of the star body move

5 more easily in the slip zone, that is when moving through the load-
6 free zone, than in the radial grooves (20) so that the sliding
7 movement in the slip zone takes place in the grooves (14) of the
8 star body (13) and in the load zone in the grooves (20) of the
9 satellites (15).

4. (canceled)

1 5. (currently amended) The satellite transmission
2 according to ~~one of claims~~ claim 3 or 4, characterized in that load
3 flanks of the grooves (14) have greater sliding or rolling friction
4 as a result of surface type and/or shape relative to the contact
5 flanks of the coupling pin (21) or slide bodies carried by the
6 coupling pin than the slip flanks and/or the grooves (20) or that
7 oppositely the load flank has less resistance than the slip flank.

1 6. (currently amended) The satellite transmission
2 according to ~~one of claims~~ claim 1 to 5, characterized in that the
3 coupling pin (21) is spring biased in the slip zone into an end of
4 the groove (20) so that much of the groove (20) is available for
5 radial compensation in the load zone.

7. (canceled)

1 8. (currently amended) The satellite transmission
2 according to ~~one of claims~~ claim 5 ~~1 to 7~~, characterized in that
3 the slide bodies have a shape or construction such that like
4 locking bodies, rollers, or free-running clutches according to the
5 load direction they slide or lock in the radial grooves so that the
6 load-direction change is initiated on entry into the load zone from
7 the groove (14) to the groove (20) and is reversed on leaving.

1 9. (currently amended) The satellite transmission
2 according to ~~one of claims~~ claim 1 ~~to 8~~, characterized in that the
3 radial grooves (14) in the star disk (13) have a stop that sets a
4 variable minimum radius for each transmission ratio and thus forces
5 the coupling pin (21) to use the radial groove (20) on the satel-
6 lite when in the load zone for geometric compensation.

1 10. (original) The satellite transmission according to
2 claim 9, characterized in that the radial guides are pivotal and
3 that control of movement of the radial guides is effected by a
4 groove (31) that is on a part whose position is fixed relative to
5 the eccentric movement of the transmission control.

1 11. (currently amended) The satellite transmission
2 according to ~~one of claims~~ claim 1 ~~to 10~~, characterized in that the
3 radial grooves are defined by guide elements (41) that are set up
4 such that they can change the width of the radial groove according

5 to the load directions of the coupling pins (52) that slide in the
6 radial grooves.

1 12. (original) The satellite transmission according to
2 claim 11, characterized in that the radial grooves formed by the
3 guide elements (41) can be narrowed so much that the coupling pins
4 or the slide bodies connected with the coupling pins are clamped in
5 the load zone and cannot move further radially.

1 13. (original) A satellite transmission having an input
2 element and an output element that can provide different transmis-
3 sion ratios by shifting into various concentric or eccentric
4 positions and that include a ring (10) with an annular groove (12)
5 and a star body (13) with radial grooves (14), and satellites (15,
6 35, 50) which are coupled to the ring (10) and that transmit torque
7 to the star body (13) by means of coupling pins (21, 52), charac-
8 terized in that the radial grooves (36) of the star disk (33) are
9 not fixed on the disk but instead are formed by separate radial
10 guides (35) that can move relative to the disk (33) to reduce or
11 eliminate irregularities.

1 14. (currently amended) The satellite transmission
2 according to ~~one of claims~~ claim 1 to 13, characterized in that the
3 satellites (15) have teeth (17) that mesh in the load zone with
4 complementary teeth (11) of the hollow ring disk (10), the satel-

5 lite (15) pivoting when moving between the load zone and the slip
6 zone.

1 15. (original) The satellite transmission according to
2 claim 14, characterized by satellites (15) shaped such that on
3 transitioning from the slip zone into the load zone the torque is
4 greater than the torque that is the product of the frictional force
5 (R) and the spacing (a) between the first teeth to mesh and the
6 satellite axis.

1 16. (original) A satellite transmission having an input
2 element and an output element that can provide different transmis-
3 sion ratios by shifting into various concentric or eccentric
4 positions and that include a ring (10) with an annular groove (12)
5 and a star body (13) with radial grooves (14), and satellites (15,
6 35, 50) which are coupled to the ring (10) and that transmit torque
7 to the star body (13) by means of coupling pins (21, 52), charac-
8 terized in that
9 the star body is formed by a support disk (63) with individually
10 secured radial segments (62) that rotate about axes collinear to
11 the drive axis so that they always lie in positions parallel to the
12 support disk (63).

1 17. (original) The satellite transmission according to
2 claim 16, characterized in that the radial segments (62) are
3 stabilized in their radial positions by springs and/or dampers.

1 18. (currently amended) The satellite transmission
2 according to ~~one of claims~~ claim 16 ~~and 17~~, characterized in that
3 the coupling pin (19) of the satellite (15) fits snugly in the
4 annular groove of the ring (19) and also fits snugly in the radial
5 groove of the radial segment (62).

1 19. (currently amended) The satellite transmission
2 according to ~~one of claims~~ claim 16 ~~to 18~~, characterized in that
3 the pivot axes of the radial segments (62) lie on an edge line on
4 the support disk (63) on which the satellites (15) ride when the
5 ring (10) and the star body (62, 63) are concentric.

1 20. (currently amended) The satellite transmission
2 according to ~~one of claims~~ claim 16 ~~to 19~~, characterized in that
3 the radial segments (62) are set in a guide of the coupling pin
4 (19) that, when the ring (10) and the star body (62, 63) are
5 eccentric, they are oriented at least generally in line with the
6 center of the ring (10).

1 21. (new) A variable-speed transmission comprising:
2 a ring centered on and rotatable about a ring axis and
3 formed with a circular track and with a radially inwardly directed
4 circular coupling surface both centered on the ring axis;
5 a star centered on and rotatable about a star axis
6 substantially parallel to the ring axis and formed with a plurality
7 of radial tracks extending substantially radially of the star axis,
8 the ring and star being relative displaceable perpendicular to
9 their axes between an eccentric position with the axes offset from
10 each other and a coaxial position with the axes coaxial;
11 a plurality of satellites angularly spaced about and
12 riding in the ring track and each having an outer end bearing on
13 the coupling surface, whereby the satellites are each maintained at
14 a substantially fixed radial spacing from the ring axis by the ring
15 track and at a substantially fixed angular spacing from one another
16 by the radial tracks, each of the satellites further being formed
17 with a respective radially extending guide; and
18 respective coupling elements each riding in a respective
19 one of the radial tracks and a respective one of the guides and
20 thereby angularly coupling the satellites angularly with the star,
21 whereby each relative rotation about one of the axes of the ring
22 and star in the eccentric position orbits the satellites through a
23 load zone in which their outer ends are coupled to the coupling
24 surface and transmit torque between the ring and star and a slip

25 zone in which their outer ends move along the coupling surface and
26 transmit no torque.

1 22. (new) The variable-speed transmission defined in
2 claim 21 wherein the outer end of each satellite and the coupling
3 surface of the ring are formed with generally complementary inter-
4 engaging teeth.

1 23. (new) The variable-speed transmission defined in
2 claim 21 wherein the tracks are grooves.

1 24. (new) The variable-speed transmission defined in
2 claim 21, further comprising
3 means between the coupling elements and the tracks for
4 inhibiting but not preventing sliding of the coupling elements on
5 the respective radial tracks while substantially not inhibiting
6 sliding of the coupling elements on the circular track.

1 25. (new) The variable-speed transmission defined in
2 claim 21 wherein the tracks are grooves and coupling elements each
3 have a large-diameter end in the respective radial groove track and
4 a small-diameter end in the circular track.

1 26. (new) The variable-speed transmission defined in
2 claim 21 wherein the radial tracks and portions of the coupling
3 elements that engage the radial tracks have a greater coefficient
4 of friction than the circular track and portions of the coupling
5 elements that engage the circular track.